



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/567,965

09/26/2006

Yuji Ishida

0230-0234PUS1

2062

2292 7590 07/27/2009  
BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER

FOX, DAVID T

ART UNIT

PAPER NUMBER

1638

NOTIFICATION DATE

DELIVERY MODE

07/27/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,965	<b>Applicant(s)</b> ISHIDA, YUJI	
	<b>Examiner</b> David T. Fox	<b>Art Unit</b> 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 4/30/09 & 5/20/09.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-26 is/are pending in the application.
- 4a) Of the above claim(s) 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-21 and 23-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 1638

***Specification Objections***

Abstract

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Applicant's submission of the first page of the published PCT application is acknowledged. However, the extraneous material on that page may not be amended in the Image File Wrapper. Applicant is requested to submit the only corresponding Abstract on a separate sheet.

Continuity Data

Page 1 of the specification is objected to for its omission of continuity data. Insertion of the following paragraph immediately under the title would obviate this objection.

---This application is a 371 of PCT/JP04/11599 filed 12 August 2004, which claims priority to Japanese application number 2003-293062 filed 13 August 2003.---

Error

Page 7 of the specification, line 2, is incorrect in its recitation of "Vol. 14" for the Ishida et al (2003) reference. According to the Information Disclosure Statement of 13 November 2006, the correct volume number is ---20---.

All specification amendments should comply with 37 CFR 1.121(b).

***Applicant's Responses***

Applicant's amendments of 30 April 2009 and 20 May 2009 have overcome all rejections not repeated below. The anticipation rejection over Allison et al has been modified in view of Applicant's amendments and arguments of 30 April 2009.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Enablement***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 5-14 and 24-26 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an *Agrobacterium*-mediated method of the immature embryos or callus of monocotyledonous plants using enriched copper concentrations during the *Agrobacterium* co-cultivation step, does not reasonably provide enablement for claims broadly drawn to the use of dicotyledonous plants or other explant types. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to the transformation of any plant species including dicotyledonous plants and any "plant material" (explant type) by *Agrobacterium* infection, involving the use of copper-enriched medium during the *Agrobacterium* co-cultivation step, to enhance transformation. In contrast, the specification only

Art Unit: 1638

demonstrates the successful transformation of immature embryos from monocotyledonous plants including maize and rice, when an enriched copper concentration is utilized during the *Agrobacterium* co-cultivation step; wherein the immature embryos may be precultured to induce callus formation. No guidance is provided for dicot transformation, or for the use of mature plant material including leaves, roots, stems, or fruits, as recited on page 16 of the specification, paragraph [0013].

Plant cell culture and transformation on copper-enriched media is unpredictable. Purnhauser et al (1993, Applicant submitted) teach that copper inhibited the transformation of the dicotyledonous plant species of *Brassica napus* or canola (see, e.g., paragraph bridging pages 136 and 137). Burns et al (US 6,900,057 effectively filed 16 January 2001) teach that copper is inhibitory to *Agrobacterium* survival (see, e.g., column 9, lines 3-14).

Moreover, Ohloft et al (US 2004/0187177 effectively filed 15 December 1999) teach that the presence of copper may activate oxidative enzymes which cause tissue browning and inhibit *Agrobacterium*-mediated transformation, wherein the use of a copper-chelator (which removes copper) is recommended. See, e.g., page 2, paragraphs [0012-0013]; page 3, paragraph [0017]; page 4, paragraph [0024]; and claims 1, 12, 37, 44, 57, 62 and 69.

Given the unpredictability as evidenced by the species-specific and inhibitory effects of copper on plant transformation, the claim breadth, and the lack of guidance in the specification; undue experimentation would have been required by one skilled in the

Art Unit: 1638

art to obtain successful *Agrobacterium*-mediated transformation of dicotyledonous plants or non-exemplified "plant material".

***Anticipation***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15-21 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Allison et al (US 7,238,862 effectively filed 22 August 2001).

The claims are drawn to a method of plant transformation with *Agrobacterium*, wherein whole transformed plants are regenerated from selected transformed plant material cultured in a medium containing an enriched amount of copper, wherein the plant may be a monocotyledonous plant including maize or rice, wherein the copper may be present as copper sulfate at a concentration of 1-50 or 1-10 micromolar, and wherein the plant material may be a "prepared" immature embryo.

The Examiner acknowledges that the specification defines "enriched" as a concentration higher than the concentration in the basal medium, as noted by Applicant in the paragraph bridging pages 6 and 7 of the Response of 30 April 2009.

Allison et al teach an *Agrobacterium*-mediated method of transforming the prepared (excised and precultured) immature embryos of monocotyledonous plant

Art Unit: 1638

species including wheat, followed by the selection of transformed cells on glyphosate- or kanamycin-containing medium, followed by whole plant regeneration on a medium comprising an enriched copper concentration, including concentrations of 2, 20 or 40 micromolar copper sulfate; wherein the enriched copper concentration (higher than the basal medium concentration of 0.1 micromolar) increased transformation efficiency.

Allison et al also teach the use of this method in maize (corn) or rice.

See, e.g., column 2, lines 28-40; column 6, lines 33-60; column 8, lines 46-51; column 8, line 64 through column 9, line 11; column 10, lines 15-24; column 10, line 60 through column 12, line 25; column 14, line 44 through column 15, line 2; columns 17-19; claims 1-3, 5 and 7.

### **Conclusion**

Claims 1-3, 5-14 and 24-26 are deemed free of the prior art, given the failure of the prior art to teach or reasonably suggest the use of an enriched copper concentration during the *Agrobacterium* co-cultivation step.

Claims drawn to an *Agrobacterium*-mediated method of monocot transformation, wherein at least the co-cultivation step is performed in the presence of an enriched copper concentration, and wherein the plant material to be transformed is an immature embryo or callus, would be deemed allowable.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (571) 272-

Art Unit: 1638

0795. The examiner can normally be reached on Monday through Friday from 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached on 571-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/David T Fox/

Primary Examiner, Art Unit 1638

July 21, 2009